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File: USPT

Feb 3, 2004

US-PAT-NO: 6685946

DOCUMENT-IDENTIFIER: US 6685946 B2

**** See image for Certificate of Correction ****

TITLE: Cold-adapted equine influenza viruses

DATE-ISSUED: February 3, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
<u>Dowling; Patricia W.</u>	Pittsburgh	PA		
Youngner; Julius S.	Pittsburgh	PA		

US-CL-CURRENT: 424/209.1; 424/204.1, 424/206.1, 435/91.1, 435/91.33, 435/91.41,
530/300, 536/23.72

CLAIMS:

What is claimed is:

1. An isolated equine influenza nucleic acid molecule selected from the group consisting of: a. an isolated nucleic acid molecule that encodes a protein comprising an amino acid sequence selected from the group consisting of SEQ ID NO:69, SEQ ID NO:92, and SEQ ID NO:107; and b. an isolated nucleic acid molecule fully complementary to a nucleic acid molecule of (a); wherein said nucleic acid molecule of (a) or (b) is not an entire equine influenza virus genome.
2. The nucleic acid molecule of claim 1, wherein said nucleic acid molecule comprises a nucleic acid sequence selected from the group consisting of SEQ ID NO:68, SEQ ID NO:70, SEQ ID NO:91, SEQ ID NO:93, SEQ ID NO:106 and SEQ ID NO:108 and a nucleic acid molecule comprising a nucleic acid sequence which is fully complementary to any of said nucleic acid sequences.
3. A nucleic acid molecule of claim 1, wherein said nucleic acid molecule encodes a protein.
4. A nucleic acid molecule of claim 1, wherein said nucleic acid molecule encodes a protein selected from the group consisting of Pei.sub.cal PB1-C.sub.396, and Pei.sub.cal PB1.sub.757.

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L1: Entry 4 of 8

File: USPT

Jun 17, 2003

US-PAT-NO: 6579528

DOCUMENT-IDENTIFIER: US 6579528 B1

TITLE: Cold-adapted equine influenza viruses

DATE-ISSUED: June 17, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
<u>Dowling; Patricia W.</u>	Pittsburgh	PA		
Youngner; Julius S.	Pittsburgh	PA		

US-CL-CURRENT: 424/209.1; 424/204.1, 424/205.1, 435/91.1, 435/91.33, 435/91.41,
530/300, 536/23.72

CLAIMS:

What is claimed:

1. An isolated equine influenza nucleic acid molecule selected from the group consisting of (a) an isolated nucleic acid molecule selected from the group consisting of SEQ ID NO:4 and SEQ ID NO:6, and (b) a nucleic acid molecule comprising a nucleic acid sequence which is fully complementary to any of said nucleic acid sequences of (a); wherein said nucleic acid molecule of (a) or (b) is not an entire equine influenza virus genome.
2. The invention according to claim 1, wherein said nucleic acid molecule comprises a cold-adapted equine influenza virus having a nucleic acid sequence selected from the group consisting of SEQ ID NO:4 and SEQ ID NO:6.
3. The invention according to claim 1, wherein said nucleic acid molecule encodes a protein comprising SEQ ID NO:5.
4. A isolated equine influenza nucleic acid molecule, wherein said equine influenza nucleic acid molecule encodes a protein SEQ ID NO:5, wherein said isolated nucleic acid molecule is not an entire equine influenza virus genome.

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☐ 15:

Modified pulmonary surfactant is a potent adjuvant that stimulates the mucosal IgA production in response to the influenza virus antigen.
J Immunol. 2006 Jan 15;176(2):1122-30.
PMID: 16394001 [PubMed - indexed for MEDLINE]

☐ 16: [Soboll G, Nelson KM, Leuthner ES, Clark RJ, Drape R, Macklin MD, Swain WF, Olsen CW, Lunn DP.](#) [Related Articles, Links](#)

Mucosal co-administration of cholera toxin and influenza virus hemagglutinin-DNA in ponies generates a local IgA response.
Vaccine. 2003 Jun 20;21(21-22):3081-92.
PMID: 12798652 [PubMed - indexed for MEDLINE]

☐ 17: [Takase H, Murakami Y, Endo A, Ikeuchi T.](#) [Related Articles, Links](#)

Antibody responses and protection in mice immunized orally against influenza virus.
Vaccine. 1996 Dec;14(17-18):1651-6.
PMID: 9032895 [PubMed - indexed for MEDLINE]

☐ 18: [Asahi Y, Yoshikawa T, Watanabe I, Iwasaki T, Hasegawa H, Sato Y, Shimada S, Nanno M, Matsuoka Y, Ohwaki M, Iwakura Y, Suzuki Y, Aizawa C, Sata T, Kurata T, Tamura S.](#) [Related Articles, Links](#)

Protection against influenza virus infection in polymeric Ig receptor knockout mice immunized intranasally with adjuvant-combined vaccines.
J Immunol. 2002 Mar 15;168(6):2930-8.
PMID: 11884464 [PubMed - indexed for MEDLINE]

☐ 19: [Matsuo K, Yoshikawa T, Asanuma H, Iwasaki T, Hagiwara Y, Chen Z, Kadowaki SE, Tsujimoto H, Kurata T, Tamura SI.](#) [Related Articles, Links](#)

Induction of innate immunity by nasal influenza vaccine administered in combination with an adjuvant (cholera toxin).
Vaccine. 2000 Jun 1;18(24):2713-22.
PMID: 10781859 [PubMed - indexed for MEDLINE]

☐ 20: [Chen KS, Burlington DB, Quinnan GV Jr.](#) [Related Articles, Links](#)

Active synthesis of hemagglutinin-specific immunoglobulin A by lung cells of mice that were immunized intragastrically with inactivated influenza virus vaccine.
J Virol. 1987 Jul;61(7):2150-4.
PMID: 3586130 [PubMed - indexed for MEDLINE]

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<input type="checkbox"/>	L4	6482414.pn. and 58	1
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L1: Entry 1 of 8

File: USPT

Nov 30, 2004

US-PAT-NO: 6824784

DOCUMENT-IDENTIFIER: US 6824784 B2

TITLE: Cold-adapted equine influenza viruses

DATE-ISSUED: November 30, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
<u>Dowling; Patricia W.</u>	Pittsburgh	PA		
Youngner; Julius S.	Pittsburgh	PA		

US-CL-CURRENT: [424/209.1](#); [424/204.1](#), [435/91.1](#), [435/91.33](#), [530/300](#), [536/23.72](#)

CLAIMS:

What is claimed:

1. An isolated equine influenza nucleic acid molecule selected from the group consisting of (a) an isolated nucleic acid molecule selected from the group consisting of (a) SEQ ID NO:10, and SEQ ID NO:12, and (b) a nucleic acid molecule comprising a nucleic acid sequence which is fully complementary to any of said nucleic acid sequences of (a); wherein said nucleic acid molecule of (a) or (b) is not an entire equine influenza virus genome.
2. An isolated equine influenza nucleic acid molecule, wherein said equine influenza nucleic acid molecule encodes a protein comprising an amino acid sequence SEQ ID NO:11, wherein said isolated nucleic acid molecule is not an entire equine influenza virus genome.
3. The invention according to claim 1, wherein said nucleic acid molecule comprises a cold-adapted equine influenza virus having a nucleic acid sequence selected from the group consisting of SEQ ID NO:10, and SEQ ID NO:12.
4. The invention according to claim 1, wherein said nucleic acid molecule comprises a cold-adapted equine influenza virus encoding an HA protein, said HA protein having an amino acid sequence comprising SEQ ID NO:11.

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- ☐ 1: [Lindstrom S, Endo A, Sugita S, Pecoraro M, Hiromoto Y, Kamada M, Takahashi T, Nerome K.](#) Related Articles, Links



Phylogenetic analyses of the matrix and non-structural genes of equine influenza viruses.

Arch Virol. 1998;143(8):1585-98.

PMID: 9739336 [PubMed - indexed for MEDLINE]

- ☐ 2: [Kawaoka Y, Gorman OT, Ito T, Wells K, Donis RO, Castrucci MR, Donatelli I, Webster RG.](#) Related Articles, Links



Influence of host species on the evolution of the nonstructural (NS) gene of influenza A viruses.

Virus Res. 1998 Jun;55(2):143-56.

PMID: 9725667 [PubMed - indexed for MEDLINE]

- ☐ 3: [Lindstrom SE, Hiromoto Y, Nishimura H, Saito T, Nerome R, Nerome K.](#) Related Articles, Links



Comparative analysis of evolutionary mechanisms of the hemagglutinin and three internal protein genes of influenza B virus: multiple cocirculating lineages and frequent reassortment of the NP, M, and NS genes.

J Virol. 1999 May;73(5):4413-26.

PMID: 10196339 [PubMed - indexed for MEDLINE]

- ☐ 4: [Ito T, Gorman OT, Kawaoka Y, Bean WJ, Webster RG.](#) Related Articles, Links



Evolutionary analysis of the influenza A virus M gene with comparison of the M1 and M2 proteins.

J Virol. 1991 Oct;65(10):5491-8.

PMID: 1895397 [PubMed - indexed for MEDLINE]

- ☐ 5: [Endo A, Pecoraro R, Sugita S, Nerome K.](#) Related Articles, Links



Evolutionary pattern of the H 3 haemagglutinin of equine influenza viruses: multiple evolutionary lineages and frozen replication.

Arch Virol. 1992;123(1-2):73-87.

PMID: 1550498 [PubMed - indexed for MEDLINE]

- ☐ 6: [Hiromoto Y, Yamazaki Y, Fukushima T, Saito T, Lindstrom SE, Omoe K, Nerome R, Lim W, Sugita S, Nerome K.](#) Related Articles, Links




Evolutionary characterization of the six internal genes of H5N1 human influenza A virus.


J Gen Virol. 2000 May;81(Pt 5):1293-303.

PMID: 10769072 [PubMed - indexed for MEDLINE]


- ☐ **7:** [Gorman OT, Bean WJ, Kawaoka Y, Webster RG.](#) Related Articles, Links

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J Virol. 1990 Apr;64(4):1487-97.
PMID: 2319644 [PubMed - indexed for MEDLINE]


- ☐ **8:** [Suarez DL, Garcia M, Latimer J, Senne D, Perdue M.](#) Related Articles, Links

 Phylogenetic analysis of H7 avian influenza viruses isolated from the live bird markets of the Northeast United States.
J Virol. 1999 May;73(5):3567-73.
PMID: 10196246 [PubMed - indexed for MEDLINE]


- ☐ **9:** [Ito T, Kawaoka Y, Ohira M, Takakuwa H, Yasuda J, Kida H, Otsuki K.](#) Related Articles, Links

 Replacement of internal protein genes, with the exception of the matrix, in equine 1 viruses by equine 2 influenza virus genes during evolution in nature.
J Vet Med Sci. 1999 Aug;61(8):987-9.
PMID: 10487248 [PubMed - indexed for MEDLINE]


- ☐ **10:** [Spackman E, Stallknecht DE, Slemons RD, Winker K, Suarez DL, Scott M, Swayne DE.](#) Related Articles, Links

 Phylogenetic analyses of type A influenza genes in natural reservoir species in North America reveals genetic variation.
Virus Res. 2005 Dec;114(1-2):89-100. Epub 2005 Jul 21.
PMID: 16039745 [PubMed - indexed for MEDLINE]


- ☐ **11:** [Gorman OT, Donis RO, Kawaoka Y, Webster RG.](#) Related Articles, Links

 Evolution of influenza A virus PB2 genes: implications for evolution of the ribonucleoprotein complex and origin of human influenza A virus.
J Virol. 1990 Oct;64(10):4893-902.
PMID: 2398532 [PubMed - indexed for MEDLINE]


- ☐ **12:** [Lindstrom SE, Hiromoto Y, Nerome R, Omoe K, Sugita S, Yamazaki Y, Takahashi T, Nerome K.](#) Related Articles, Links

 Phylogenetic analysis of the entire genome of influenza A (H3N2) viruses from Japan: evidence for genetic reassortment of the six internal genes.
J Virol. 1998 Oct;72(10):8021-31.
PMID: 9733841 [PubMed - indexed for MEDLINE]

- ☐ **13:** [Nakajima K, Nobusawa E, Ogawa T, Nakajima S.](#) Related Articles, Links

 Evolution of the NS genes of the influenza A viruses. I. The genetic relatedness of the NS genes of animal influenza viruses.
Virus Genes. 1990 Jun;4(1):5-13.
PMID: 2144066 [PubMed - indexed for MEDLINE]

- ☐ **14:** [Basler CF, Reid AH, Dybing JK, Janczewski TA, Fanning TG, Zheng H, Salvatore M, Perdue ML, Swayne DE, Garcia-Sastre A, Palese P, Taubenberger JK.](#) Related Articles, Links

 Sequence of the 1918 pandemic influenza virus nonstructural gene (NS) segment and characterization of recombinant viruses bearing the 1918 NS genes.
Proc Natl Acad Sci U S A. 2001 Feb 27;98(5):2746-51.
PMID: 11226311 [PubMed - indexed for MEDLINE]

☐ **15:** [Saito T, Kawaoka Y, Webster RG.](#) [Related Articles, Links](#)



Phylogenetic analysis of the N8 neuraminidase gene of influenza A viruses.

Virology. 1993 Apr;193(2):868-76.

PMID: 8460490 [PubMed - indexed for MEDLINE]

☐ **16:** [Lai AC, Chambers TM, Holland RE Jr, Morley PS, Haines DM, Townsend HG, Barrandeguy M.](#) [Related Articles, Links](#)



Diverged evolution of recent equine-2 influenza (H3N8) viruses in the Western Hemisphere.

Arch Virol. 2001;146(6):1063-74.

PMID: 11504416 [PubMed - indexed for MEDLINE]

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Multiple alignment comparison of the non-structural genes of influenza A viruses.

Virus Res. 1998 Mar;54(1):59-69.

PMID: 9660072 [PubMed - indexed for MEDLINE]

☐ **18:** [Nakao H, Nakajima K, Nakajima S.](#) [Related Articles, Links](#)



Location on the evolutionary trees of the non-structural protein (NS) and neuraminidase (NA) genes of late human influenza A (H2N2) viruses: parental viruses of the NS and NA genes of Hong Kong influenza A (H3N2) viruses.

J Gen Virol. 1993 Aug;74 (Pt 8):1667-72.

PMID: 8345357 [PubMed - indexed for MEDLINE]

☐ **19:** [Daly JM, Lai AC, Binns MM, Chambers TM, Barrandeguy M, Mumford JA.](#) [Related Articles, Links](#)



Antigenic and genetic evolution of equine H3N8 influenza A viruses.

J Gen Virol. 1996 Apr;77 (Pt 4):661-71.

PMID: 8627254 [PubMed - indexed for MEDLINE]

☐ **20:** [Borchers K, Daly J, Stiens G, Kreling K, Kreling I, Ludwig H.](#) [Related Articles, Links](#)



Characterisation of three equine influenza A H3N8 viruses from Germany (2000 and 2002): evidence for frozen evolution.

Vet Microbiol. 2005 Apr 25;107(1-2):13-21.

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☐ 1. Document ID: US 6824784 B2

L1: Entry 1 of 8

File: USPT

Nov 30, 2004

US-PAT-NO: 6824784

DOCUMENT-IDENTIFIER: US 6824784 B2

TITLE: Cold-adapted equine influenza viruses

DATE-ISSUED: November 30, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
<u>Dowling; Patricia W.</u>	Pittsburgh	PA		
Youngner; Julius S.	Pittsburgh	PA		

US-CL-CURRENT: 424/209.1; 424/204.1, 435/91.1, 435/91.33, 530/300, 536/23.72

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Chemical	Claims	KWIC	Draw. De
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☐ 2. Document ID: US 6685946 B2

L1: Entry 2 of 8

File: USPT

Feb 3, 2004

US-PAT-NO: 6685946

DOCUMENT-IDENTIFIER: US 6685946 B2

**** See image for Certificate of Correction ****

TITLE: Cold-adapted equine influenza viruses

DATE-ISSUED: February 3, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
<u>Dowling; Patricia W.</u>	Pittsburgh	PA		
Youngner; Julius S.	Pittsburgh	PA		

US-CL-CURRENT: 424/209.1; 424/204.1, 424/206.1, 435/91.1, 435/91.33, 435/91.41,
530/300, 536/23.72

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Chemical	Claims	KWIC	Draw. De
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☐ 3. Document ID: US 6649169 B2

L1: Entry 3 of 8

File: USPT

Nov 18, 2003

US-PAT-NO: 6649169

DOCUMENT-IDENTIFIER: US 6649169 B2

**** See image for Certificate of Correction ****

TITLE: Cold-adapted equine influenza viruses

DATE-ISSUED: November 18, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
<u>Dowling; Patricia W.</u>	Pittsburgh	PA		
Youngner; Julius S.	Pittsburgh	PA		

US-CL-CURRENT: 424/209.1; 424/204.1, 424/206.1, 435/235.1, 435/237, 435/239

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 4. Document ID: US 6579528 B1

L1: Entry 4 of 8

File: USPT

Jun 17, 2003

US-PAT-NO: 6579528

DOCUMENT-IDENTIFIER: US 6579528 B1

TITLE: Cold-adapted equine influenza viruses

DATE-ISSUED: June 17, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
<u>Dowling; Patricia W.</u>	Pittsburgh	PA		
Youngner; Julius S.	Pittsburgh	PA		

US-CL-CURRENT: 424/209.1; 424/204.1, 424/205.1, 435/91.1, 435/91.33, 435/91.41,
530/300, 536/23.72

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 5. Document ID: US 6482414 B1

L1: Entry 5 of 8

File: USPT

Nov 19, 2002

US-PAT-NO: 6482414

DOCUMENT-IDENTIFIER: US 6482414 B1

TITLE: Cold-adapted equine influenza viruses

DATE-ISSUED: November 19, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
<u>Dowling; Patricia W.</u>	Pittsburgh	PA		
Youngner; Julius S.	Pittsburgh	PA		

US-CL-CURRENT: [424/209.1](#); [424/186.1](#), [424/204.1](#), [435/91.1](#), [435/91.33](#), [530/300](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMC	Draw D
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☐ 6. Document ID: US 6436408 B1

L1: Entry 6 of 8

File: USPT

Aug 20, 2002

US-PAT-NO: 6436408

DOCUMENT-IDENTIFIER: US 6436408 B1

TITLE: Cold-adapted equine influenza viruses

DATE-ISSUED: August 20, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
<u>Dowling; Patricia W.</u>	Pittsburgh	PA		
Youngner; Julius S.	Pittsburgh	PA		

US-CL-CURRENT: [424/209.1](#); [424/204.1](#), [424/206.1](#), [435/235.1](#), [435/237](#), [435/239](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMC	Draw D
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☐ 7. Document ID: US 6177082 B1

L1: Entry 7 of 8

File: USPT

Jan 23, 2001

US-PAT-NO: 6177082

DOCUMENT-IDENTIFIER: US 6177082 B1

TITLE: Cold-adapted equine influenza viruses

DATE-ISSUED: January 23, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
<u>Dowling; Patricia W.</u>	Pittsburgh	PA		
Youngner; Julius S.	Pittsburgh	PA		

US-CL-CURRENT: [424/209.1](#); [424/204.1](#), [424/206.1](#), [435/235.1](#), [435/237](#), [435/239](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMIC	Draw. De
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☐ 8. Document ID: US 5149531 A

L1: Entry 8 of 8

File: USPT

Sep 22, 1992

US-PAT-NO: 5149531

DOCUMENT-IDENTIFIER: US 5149531 A

**** See image for Certificate of Correction ****

TITLE: Method of using cold-adapted live influenza virus vaccine as an antiviral agent against influenza

DATE-ISSUED: September 22, 1992

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Youngner; Julius S.	Pittsburgh	PA		
<u>Dowling; Patricia W.</u>	Pittsburgh	PA		

US-CL-CURRENT: 424/93.6; 424/209.1, 424/821

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMIC	Draw. De
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L2: Entry 1 of 2

File: DWPI

Nov 11, 2004

DERWENT-ACC-NO: 2002-010769

DERWENT-WEEK: 200475

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TITLE: Treating an animal for respiratory disease, particularly caused by equine influenza virus, comprises administering a composition comprising a virus a cold-adapted equine influenza virus or a reassortant influenza A virus

INVENTOR: DOWLING, P W; YOUNGNER, J S ; YOUNGER, J S

PRIORITY-DATA: 2000US-194325P (April 3, 2000), 2001US-0813920 (March 21, 2001), 2002US-0239972 (December 23, 2002)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
<u>US 20040223980 A1</u>	November 11, 2004		000	A61K039/145
<u>WO 200174386 A2</u>	October 11, 2001	E	049	A61K039/12
<u>US 20010051161 A1</u>	December 13, 2001		000	A61K039/145
<u>AU 200149300 A</u>	October 15, 2001		000	
<u>EP 1267920 A2</u>	January 2, 2003	E	000	A61K039/145
<u>JP 2003528925 W</u>	September 30, 2003		062	A61K039/145

INT-CL (IPC): A01 K 13/00; A61 K 39/12; A61 K 39/145; A61 P 11/00; A61 P 31/04; A61 P 31/12; A61 P 31/16; C12 Q 1/70

Full	Title	Citation	Front	Review	Classification	Date	Reference	Abstract	References	Claims	Keyword	Draw Data
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☐ 2. Document ID: US 6824784 B2, WO 200009702 A1, AU 9954877 A, US 6177082 B1, EP 1105497 A1, US 6436408 B1, JP 2002522078 W, AU 760356 B, US 6579528 B1, US 20030180322 A1, US 20030199074 A1, US 6649169 B2, US 20040022809 A1, US 20040137015 A1, US 20040234553 A1

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File: DWPI

Nov 30, 2004

DERWENT-ACC-NO: 2000-224339

DERWENT-WEEK: 200479

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TITLE: New cold-adapted equine influenza viruses and reassortant viruses used as vaccines for treating influenza infections in animals, particularly horses, have a

phenotype such as temperature sensitivity or dominant interference

INVENTOR: DOWLING, P W; YOUNGNER, J S

PRIORITY-DATA: 1998US-0133921 (August 13, 1998), 2000US-0634159 (August 9, 2000), 2001US-0762861 (August 24, 2001), 2002US-0180633 (June 26, 2002), 2003US-0434811 (May 8, 2003), 2004US-0872014 (June 18, 2004)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
<u>US 6824784 B2</u>	November 30, 2004		000	A61K039/145
<u>WO 200009702 A1</u>	February 24, 2000	E	127	C12N015/44
<u>AU 9954877 A</u>	March 6, 2000		000	
<u>US 6177082 B1</u>	January 23, 2001		000	A61K039/145
<u>EP 1105497 A1</u>	June 13, 2001	E	000	C12N015/44
<u>US 6436408 B1</u>	August 20, 2002		000	A61K039/145
<u>JP 2002522078 W</u>	July 23, 2002		141	C12N015/09
<u>AU 760356 B</u>	May 15, 2003		000	C12N015/44
<u>US 6579528 B1</u>	June 17, 2003		000	A61K039/145
<u>US 20030180322 A1</u>	September 25, 2003		000	C12P021/06
<u>US 20030199074 A1</u>	October 23, 2003		000	A61K039/145
<u>US 6649169 B2</u>	November 18, 2003		000	A61K039/145
<u>US 20040022809 A1</u>	February 5, 2004		000	A61K039/145
<u>US 20040137015 A1</u>	July 15, 2004		000	A61K039/145
<u>US 20040234553 A1</u>	November 25, 2004		000	A61K039/145

20040234553 A1 INT-CL (IPC): A61 K 39/12; A61 K 39/145; A61 P 31/16; C07 H 21/04; C07 K 14/11; C07 K 14/115; C12 N 7/00; C12 N 7/02; C12 N 7/04; C12 N 7/08; C12 N 15/09; C12 N 15/44; C12 P 19/34; C12 P 21/06; C12 N 7/04; C12 R 1:92

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L3: Entry 1 of 9

File: PGPB

Aug 11, 2005

PGPUB-DOCUMENT-NUMBER: 20050175985

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20050175985 A1

TITLE: Cold-adapted equine influenza viruses

PUBLICATION-DATE: August 11, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Dowling, Patricia W	Pittsburgh	PA	US
Youngner, Julius S	Pittsburgh	PA	US

US-CL-CURRENT: 435/5; 435/235.1, 530/350, 536/23.72

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMOC	Draw. Da
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☐ 2. Document ID: US 20050039739 A1

L3: Entry 2 of 9

File: PGPB

Feb 24, 2005

PGPUB-DOCUMENT-NUMBER: 20050039739

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20050039739 A1

TITLE: Equine intranasal delivery system

PUBLICATION-DATE: February 24, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Penner, Steven J.	Broomfield	CO	US
Sebring, Randal W.	Fort Collins	CO	US

US-CL-CURRENT: 128/200.23

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMOC	Draw. Da
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☐ 3. Document ID: US 20040234553 A1

L3: Entry 3 of 9

File: PGPB

Nov 25, 2004

PGPUB-DOCUMENT-NUMBER: 20040234553

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20040234553 A1

TITLE: Cold-adapted equine influenza viruses

PUBLICATION-DATE: November 25, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Dowling, Patricia W.	Pittsburgh	PA	US
Youngner, Julius S.	Pittsburgh	PA	US

US-CL-CURRENT: 424/206.1; 435/235.1

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. D
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☐ 4. Document ID: US 20040223980 A1

L3: Entry 4 of 9

File: PGPB

Nov 11, 2004

PGPUB-DOCUMENT-NUMBER: 20040223980

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20040223980 A1

TITLE: Cold-adapted equine influenza viruses

PUBLICATION-DATE: November 11, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Dowling, Patricia W	Pittsburgh	PA	US
Younger, Julius S	Pittsburgh	PA	US

US-CL-CURRENT: 424/206.1; 435/5

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. D
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☐ 5. Document ID: US 20040137015 A1

L3: Entry 5 of 9

File: PGPB

Jul 15, 2004

PGPUB-DOCUMENT-NUMBER: 20040137015

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20040137015 A1

TITLE: Cold-adapted equine influenza viruses

PUBLICATION-DATE: July 15, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Dowling, Patricia W.	Pittsburgh	PA	US
Youngner, Julius S.	Pittsburgh	PA	US

US-CL-CURRENT: 424/209.1; 435/235.1

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw Data
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☐ 6. Document ID: US 20040022809 A1

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File: PGPB

Feb 5, 2004

PGPUB-DOCUMENT-NUMBER: 20040022809

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20040022809 A1

TITLE: Cold-adapted equine influenza viruses

PUBLICATION-DATE: February 5, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Dowling, Patricia W.	Pittsburgh	PA	US
Youngner, Julius S.	Pittsburgh	PA	US

US-CL-CURRENT: 424/206.1; 435/235.1

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw Data
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☐ 7. Document ID: US 20030199074 A1

L3: Entry 7 of 9

File: PGPB

Oct 23, 2003

PGPUB-DOCUMENT-NUMBER: 20030199074

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030199074 A1

TITLE: Cold-adapted equine influenza viruses

PUBLICATION-DATE: October 23, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Dowling, Patricia W.	Pittsburgh	PA	US
Youngner, Julius S.	Pittsburgh	PA	US

US-CL-CURRENT: [435/235.1](#); [530/350](#), [536/23.72](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. De
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☐ 8. Document ID: US 20030180322 A1

L3: Entry 8 of 9

File: PGPB

Sep 25, 2003

PGPUB-DOCUMENT-NUMBER: 20030180322

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030180322 A1

TITLE: Cold-adapted equine influenza viruses

PUBLICATION-DATE: September 25, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Dowling, Patricia W.	Pittsburgh	PA	US
Youngner, Julius S.	Pittsburgh	PA	US

US-CL-CURRENT: [424/204.1](#); [424/186.1](#), [435/69.1](#), [435/91.1](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. De
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☐ 9. Document ID: US 20010051161 A1

L3: Entry 9 of 9

File: PGPB

Dec 13, 2001

PGPUB-DOCUMENT-NUMBER: 20010051161

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20010051161 A1

TITLE: Cold-adapted equine influenza viruses

PUBLICATION-DATE: December 13, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Dowling, Patricia W.	Pittsburgh	PA	US
Youngner, Julius S.	Pittsburgh	PA	US

US-CL-CURRENT: [424/206.1](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. De
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PMID: 12798624 [PubMed - indexed for MEDLINE]

- ☐ 2: [Chen D, Burger M, Chu Q, Endres R, Zuleger C, Dean H, Payne LG.](#) Related Articles, Links

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Virus Res. 2004 Jul;103(1-2):147-53.
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PMID: 11483740 [PubMed - indexed for MEDLINE]










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Epidermal powder immunization induces both cytotoxic T-lymphocyte and antibody responses to protein antigens of influenza and hepatitis B viruses.
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PMID: 15542190 [PubMed - indexed for MEDLINE]
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PMID: 15802970 [PubMed - indexed for MEDLINE]
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Vaccine. 1988 Oct;6(5):409-13.
PMID: 2848377 [PubMed - indexed for MEDLINE]
- ☐ **10:** [Asanuma H, Hirokawa K, Uchiyama M, Suzuki Y, Aizawa C, Kurata T, Sata T, Tamura S.](#) Related Articles, Links
-  **Immune responses and protection in different strains of aged mice immunized intranasally with an adjuvant-combined influenza vaccine.**
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Immunostimulant patch containing heat-labile enterotoxin from *Escherichia coli* enhances immune responses to injected influenza virus vaccine through activation of skin dendritic cells.

J Virol. 2003 May;77(9):5218-25.
PMID: 12692224 [PubMed - indexed for MEDLINE]

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Protection against influenza virus infection by vaccine inoculated intranasally with cholera toxin B subunit. Vaccine. 1988 Oct;6(5):409-13. PMID: 2848377 [PubMed - indexed for MEDLINE]
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Protection against influenza virus infection by a two-dose regimen of nasal vaccination using vaccines combined with cholera toxin B subunit. Vaccine. 1989 Aug;7(4):314-20. PMID: 2815967 [PubMed - indexed for MEDLINE]
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Enhancement of protective antibody responses by cholera toxin B subunit inoculated intranasally with influenza vaccine. Vaccine. 1989 Jun;7(3):257-62. PMID: 2781859 [PubMed - indexed for MEDLINE]
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PMID: 1634780 [PubMed - indexed for MEDLINE]
- ☐ 8: [Asanuma H, Hirokawa K, Uchiyama M, Suzuki Y, Aizawa C, Kurata T, Sata T, Tamura S.](#) Related Articles, Links
Immune responses and protection in different strains of aged mice immunized intranasally with an adjuvant-combined influenza vaccine. *Vaccine.* 2001 Jul 16;19(28-29):3981-9.
PMID: 11427274 [PubMed - indexed for MEDLINE]
- ☐ 9: [Nedrud JG, Liang XP, Hague N, Lamm ME.](#) Related Articles, Links
Combined oral/nasal immunization protects mice from Sendai virus infection. *J Immunol.* 1987 Nov 15;139(10):3484-92.
PMID: 2824609 [PubMed - indexed for MEDLINE]
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PMID: 12559794 [PubMed - indexed for MEDLINE]
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PMID: 10992481 [PubMed - indexed for MEDLINE]
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